

Date: Fri, 25 Mar 94 18:12:53 PST
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V94 #329
To: Info-Hams

Info-Hams Digest Fri, 25 Mar 94 Volume 94 : Issue 329

Today's Topics:

(none)
* SpaceNews 28-Mar-94 *
2N2222 vs 2N2222A (was HAMS and hams)
FT-530 and FT-41R
Hamfest Listing
Info-Hams Digest V94 #328
Latest callsigns assigned list?
Motorola GPS engine group purchase update
ORBS\$084.MISC.AMSAT
QRP Quarterly?
RF and AF speech processors. Was: FT-990 vs TS-850 (3 msgs)
SCM0 receiver.

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 25 Mar 94 23:11:38 GMT
From: news-mail-gateway@ucsd.edu
Subject: (none)
To: info-hams@ucsd.edu

SUBSCRIBE

Date: 25 Mar 94 17:05:13 GMT
From: news-mail-gateway@ucsd.edu

Subject: * SpaceNews 28-Mar-94 *
To: info-hams@ucsd.edu

SB NEWS @ AMSAT \$SPC0328
* SpaceNews 28-Mar-94 *

BID: \$SPC0328

=====
SpaceNews
=====

MONDAY MARCH 28, 1994

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

* ITAMSAT PROBLEM *

=====

Earlier this month, the PSK modulation on the primary ITAMSAT transmitter became more and more difficult to decode. A residual carrier and lower output power seem to indicate a failure in the PSK balanced modulator, being worse at the current low power setting. Increasing the power level makes the demodulation better but is not acceptable due to power budget constraints. Ground controllers decided to switch to the secondary PSK transmitter on 435.822 MHz. The first two passes over Italy confirmed the correct operation of the spacecraft and WOD are being taken to analyze the performance of the satellite in this new configuration. The BBS is working as usual and status bulletins are uploaded to the satellite.

73 de ITAMSAT (IO-26) Command Team

[Info via Alberto E. Zagni, I2KBD]

* CLEMENTINE IMAGES AVAILABLE *

=====

Recent images of the Moon that were downlinked by the Clementine spacecraft are available by ftp or email across the Internet. For those with ftp access, simply ftp to clementine.s1.gov [128.15.32.9] and look in the directories under pub/clementine/images. For those with email only, send a message to ftpmail@clementine.s1.gov with a blank subject line and text of "help" only. The email server can provide directory listings and

uuencoded binary files such as GIF images.

[Info via Walt, KE3HP]

* OSCAR-13 MODE-S EXTRA BEACON *

=====

In response to requests, the Mode-S session now includes 2 MAs beacon at the start. Mode-B is unaffected. The revised schedule is:

M QST *** AO-13 TRANSPONDER SCHEDULE *** 1994 Mar 19-Apr 04

Mode-B : MA 0 to MA 90 |

Mode-BS : MA 90 to MA 120 |

Mode-S : MA 120 to MA 122 |<- S beacon only

Mode-S : MA 122 to MA 145 |<- S transponder; B trsp. is OFF

Mode-S : MA 145 to MA 150 |<- S beacon only

Mode-BS : MA 150 to MA 180 | Alon/Alat 180/0

Mode-B : MA 180 to MA 256 |

Omnis : MA 230 to MA 30 | Move to attitude 235/0, Apr 04

[Info via James Miller G3RUH @ GB7DDX.#22.GBR.EU]

* FO-20 SCHEDULE *

=====

The FO-20 command station announced that FO-20 will be placed in Mode JA (Analog transponder mode) during Field Day 1994 (25-Jun-94 18:00 UTC through 26-Jun-94 18:00 UTC).

The current operating schedule is as follows:

Analog mode:

23-Mar-94 07:52 -to- 30-Mar-94 08:15 UTC

Digital mode: Unless otherwise noted above.

[Info via Kazu Sakamoto, JJ1WTK]

* THANKS! *

=====

Thanks to BY1QH and K7YHA for the high praise SpaceNews received in articles appearing in the April 1994 issues of 73 and Worldradio magazines! Also thanks to WA1QYM and DL3HRT for their recent messages of appreciation.

* MESSAGES de KD2BD *

=====

G8MWF: Please re-send your WXSAT article. I lost the disk I had it saved to. :-(

* FEEDBACK/INPUT WELCOMED *

=====

Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107

PACKET : KD2BD @ N2KZH.NJ.USA.NA

INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD
Department of Engineering and Technology
Advanced Technology Center
Brookdale Community College
Lincroft, New Jersey 07738
U.S.A.

<<-- SpaceNews: The first amateur newsletter read in space! -->>

/EX

--

John A. Magliacane, KD2BD * /\ /\ * Voice : 1-908-224-2948
Advanced Technology Center |/\ /\ /\ | Packet : KD2BD @ N2KZH.NJ.USA.NA
Brookdale Community College |/\ /\ /\ | Internet: kd2bd@ka2qhd.ocpt.ccur.com
Lincroft, NJ 07738 * /\ /\ * Morse : -. -.. ..--- -... -..

Date: 25 Mar 94 21:32:09 GMT
From: news-mail-gateway@ucsd.edu
Subject: 2N2222 vs 2N2222A (was HAMS and hams)
To: info-hams@ucsd.edu

In article <2mfo8e\$c69@gerald.cc.utexas.edu> oo7@astro.as.utexas.edu
(Derek Will s) writes:

[stuff about the capitalization of ham deleted]

>

> Perhaps someone who used to think it is capitalized and now
knows > better can tell me why they used to think this. It
would clear up > a problem and make several people who have
nothing better to worry > about much happier.

I say: I suppose it depends on which legend re: the origin of the term "ham" as it applies to amateur radio comes from. Several of the legends indicate the term is from either initials or an acronym, and both would be properly capitalized.

Jeff NH6IL writes:

Here's more to worry about: why capitalize

MF, HF, VHF, UHF, CW, AM, FM, SSB, D-layer, E-layer, F1-layer, F2-layer (and why no A- B- or C-layers?),

I say: In the above examples, the capitalized letters are initials

Any difference in specs between a 2N2222 and a 2N2222A xsistor? (And why did I capitalize the N and A?) An xmtr I'm building calls for 2N2222A's but all I have are dozens of 2N2222's (from dumpster diving behind the Engineering Department's building - amazing what they throw out).

I imagine the 'A' version is the new and improved model.

I say (now on the real subject): The "A" devices have a different gain characteristic, (hFE @ 10v 10ma 50-325 for the 2222, 75-325 for the "A"), higher minimum breakdown voltages, lower VCE sat voltage. In most cases, it won't matter which you use. The chips are the same and the manufacturer screens for part type selection. Since the 2N2222 minimums are lower than those for the 2N2222A, A 2N2222A can always sub for a 2N2222, a 2N2222 may not always work for a 2N2222A. Both devices were registered at the same time, so it is not a matter of "new and improved". Check a Motorola small signal spec book or MIL-S-19500/255 if you really need to know the finer points.

73

Wm. A. Kirsanoff Internet: WAKIRSAN@ananov.remnet.ab.com
Rockwell International Ham: KD6MCI
(714) 762-2872
Alternate Internet: william_a._kirsanoff@ccmail.anatcp.rockwell.com

Who are you? * I am number 2. * Who is number 1? * You are number 6.

Date: Fri, 25 Mar 1994 19:51:56 GMT

From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!math.ohio-state.edu!magnus.acs.ohio-state.edu!csn!
col.hp.com!fc.hp.com!paulc@network.ucsd.edu
Subject: FT-530 and FT-41R
To: info-hams@ucsd.edu

On FT530 voltmeter error:

I have a different problem. Mine reads about .5 volt low at about 7 volts, progressing to 1 volt low at 13 volts. Don't know if this can be tweaked up or not. It's still a useful thing to have.

-Paul C.

Date: Fri, 25 Mar 1994 23:19:00 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!howland.reston.ans.net!math.ohio-state.edu!
magnus.acs.ohio-state.edu!csn!news.den.mmc.com!news2!pogo.den.mmc.com!
boutell@network.ucsd.edu
Subject: Hamfest Listing
To: info-hams@ucsd.edu

In article <199403251458.GAA04442@ucsd.edu>

William=E.=Newkirk%Pubs%GenAv.Mlb@ns14.cca.CR.rockwell.COM writes:

>>I've been searching around for a listing of upcoming hamfests, and have
>>been unable to find one. So, I've decided to do the next best thing -
>>create my own.

>

>i'm assuming you are looking for an electronic one?

>

>they're published in just about all the amateur radio magazines, especially
>QST, CQ, 73 and Worldradio, if you're looking for a "printed" one.

>

>an electronic one would be neat.

>

>bill wb9ivr

>

ARRL (should be capitalized here :-) has an AUTOMATED ELECTRONIC MAIL SERVER from which you can request info on hamfests (or HAMfests) as well as many other topics.

For the hamfest info specifically, do the following:

mail info@arrl.org

...in the body of the letter type:

send HAMFESTS-USA
quit

...and just cntl-D out and you will receive the info in short order.

Date: 25 Mar 94 23:56:21 GMT
From: news-mail-gateway@ucsd.edu
Subject: Info-Hams Digest V94 #328
To: info-hams@ucsd.edu

From: POSTMSTR @SSW
To: HCHOAGLAND @MRGATE
IN%"Info-Hams @UCSD.EDU" @MRGATE @BV8500

Author: IN%"Info-Hams@UCSD.EDU"
Sender: IN%"INFO-HAMS @UCSD.EDU"@MRGATE@BV8500
Subject: Info-Hams Digest V94 #328
Message Class:

Recipients:

Profile Recipient(s):

CCMAIL -RL636614 *RLMEYERING @CCMAIL @BIIVAX

The MAILbridge Server/DEC was unable to deliver mail
from Sender IN%"INFO-HAMS@UCSD.EDU"@MRGATE@BV8500.
Please contact your Soft-Switch E-Mail Administrator to register this user
in the Name Translate Directory.

Date: Fri, 25 Mar 1994 20:50:17 GMT
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!library.ucla.edu!csulb.edu!csus.edu!
netcom.com!ab5sm@network.ucsd.edu
Subject: Latest callsigns assigned list?
To: info-hams@ucsd.edu

Milt Forsberg (miltf@ux1.cso.uiuc.edu) wrote:
: brown_mi@eisner.decus.org (Michael D Brown) writes:

: >I am looking for an update on the latest callsigns assigned by the FCC. There

: >is a list that appears in QST every month, but it is always two months behind -
: >I am anxiously awaiting my new 2x2 call, and it would be nice to see where they
: >Mike
: >N90PG/AA

: In 9land, as of March 1, it is AA9KI for Extra, KF9UM for Advanced, N9WHC
: for Tech/General, and KB9IXF for Novice. Turnaround was reported as being
: 10-12 weeks.

: I have not seen any postings recently on turnaround actual time. A few months
: ago, there were many notes on here giving actual times. Some were much sooner
: than reported by the FCC. I guess they were being conservative in the
: recorded message.

: Milt, K9QZI

it took right at 6 weeks for me to get my 2x2 .. i submitted my 610 on
dec 15 .. they issued the call jan 15, and then it two weeks for them to
mail it. i received it the first week of february

lee - ab5sm

--

ab5sm@netcom.com

Date: Fri, 25 Mar 1994 14:14:50
From: ihnp4.ucsd.edu!usc!yeshua.marcam.com!news.kei.com!ssd.intel.com!chnews!
ornews.intel.com!ccm.hf.intel.com!brett_miller@network.ucsd.edu
Subject: Motorola GPS engine group purchase update
To: info-hams@ucsd.edu

In article <1994Mar24.215841.28632@nntpd2.cxo.dec.com> bonomo@specxn.enet.dec.com
() writes:

I tried to mail this directly, but it wouldn't go.

What exactly is included in this engine? Do I have to come up with my own
antenna, displ, display driver, input control logic, etc.? \$150 is a great
price but I just don't have the time for such major electronics projects any
more.

Thanks for your help.

Brett Miller N70LQ
Intel Corp.
American Fork, UT

brett_miller@ccm.hf.intel.com

Date: 25 Mar 94 13:57:00 GMT
From: news-mail-gateway@ucsd.edu
Subject: ORBS\$084.MISC.AMSAT
To: info-hams@ucsd.edu

SB KEPS @ AMSAT \$ORBS-084.M
Orbital Elements 084.MISC

HR AMSAT ORBITAL ELEMENTS FOR MANNED AND MISCELLANEOUS SATELLITES
FROM WA5QGD FORT WORTH, TX March 25, 1994
BID: \$ORBS-084.M
TO ALL RADIO AMATEURS BT

Satellite: POSAT
Catalog number: 22829
Epoch time: 94081.13993678
Element set: 265
Inclination: 98.6563 deg
RA of node: 157.8404 deg
Eccentricity: 0.0011057
Arg of perigee: 89.9512 deg
Mean anomaly: 270.2938 deg
Mean motion: 14.28013136 rev/day
Decay rate: 9.8e-07 rev/day^2
Epoch rev: 2527
Checksum: 321

Satellite: MIR
Catalog number: 16609
Epoch time: 94083.32520032
Element set: 537
Inclination: 51.6456 deg
RA of node: 251.6581 deg
Eccentricity: 0.0015343
Arg of perigee: 67.8161 deg
Mean anomaly: 292.4504 deg
Mean motion: 15.58331750 rev/day
Decay rate: 9.346e-05 rev/day^2
Epoch rev: 46281
Checksum: 293

Satellite: HUBBLE
Catalog number: 20580
Epoch time: 94080.23738730
Element set: 459
Inclination: 28.4697 deg
RA of node: 80.9010 deg
Eccentricity: 0.0005913
Arg of perigee: 249.5279 deg
Mean anomaly: 110.4672 deg
Mean motion: 14.90534070 rev/day
Decay rate: 8.35e-06 rev/day^2
Epoch rev: 1625
Checksum: 290

Satellite: GRO
Catalog number: 21225
Epoch time: 94079.53676843
Element set: 75
Inclination: 28.4636 deg
RA of node: 127.3366 deg
Eccentricity: 0.0003390
Arg of perigee: 287.6252 deg
Mean anomaly: 72.3973 deg
Mean motion: 15.40420925 rev/day
Decay rate: 4.336e-05 rev/day^2
Epoch rev: 4325
Checksum: 300

Satellite: UARS
Catalog number: 21701
Epoch time: 94082.87298435
Element set: 496
Inclination: 56.9828 deg
RA of node: 140.9350 deg
Eccentricity: 0.0004265
Arg of perigee: 92.4899 deg
Mean anomaly: 267.6620 deg
Mean motion: 14.96488088 rev/day
Decay rate: -3.323e-05 rev/day^2
Epoch rev: 13816
Checksum: 341

/EX

Date: Fri, 25 Mar 1994 19:13:20 GMT

From: ihnp4.ucsd.edu!usc!math.ohio-state.edu!howland.reston.ans.net!
newsserver.jvnc.net!panasonic.com!atvl6!wiseman@network.ucsd.edu
Subject: QRP Quarterly?
To: info-hams@ucsd.edu

I saw a publication entitled "QRP Quarterly" referenced in 73 last month.
Does anybody know who publishes this, and where I could get a copy to
check out?

John
KA5WTO

Date: Fri, 25 Mar 1994 15:52:40 GMT
From: ihnp4.ucsd.edu!swrinde!emory!rsiatl!ke4zv!gary@network.ucsd.edu
Subject: RF and AF speech processors. Was: FT-990 vs TS-850
To: info-hams@ucsd.edu

In article <Cn6ryH.E5w@srigenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
>

>(By eliminating the crystal filter, phasing-type SSB transmitters have
>better phase and amplitude flatness than filter-type rigs.)

Phffft! The phase flatness through the audio phase shift networks
used in amateur phasing SSB rigs was much worse than any phase
distortion in a filter rig. The audio phasing network had to cover
octaves while the crystal filter only has to work over a tiny fraction
of an octave.

Amplitude flatness, low frequency response, and total bandwidth were
often greater with phasing generators. That gave a more AM-like sound
to phasing generated SSB.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Fri, 25 Mar 1994 15:45:54 GMT
From: ihnp4.ucsd.edu!swrinde!emory!rsiatl!ke4zv!gary@network.ucsd.edu
Subject: RF and AF speech processors. Was: FT-990 vs TS-850
To: info-hams@ucsd.edu

In article <Cn6rJx.Dw9@srngenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
>

>It seems like you could use a DSP to do a very good job of automatic
>gain control on the audio signal. The problem with analog AGC circuits
>is the "popping" that occurs due to the time delay of the AGC driver
>upon encountering a sudden large signal. A DSP could store a few
>milliseconds of audio at a time so it could reduce the gain just
>before the sudden large signal, eliminating the pop.

We solved that problem years ago without need of DSP. We just
put a delay line in the main channel so the AGC has time to react
before the audio gets out of the box. It used to be a mercury
column, but today it's often a bucket brigade shift register.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Fri, 25 Mar 1994 20:17:15 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!howland.reston.ans.net!math.ohio-state.edu!
magnus.acs.ohio-state.edu!csn!col.hp.com!srngenprp!alanb@network.ucsd.edu
Subject: RF and AF speech processors. Was: FT-990 vs TS-850
To: info-hams@ucsd.edu

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:

: In article <Cn6ryH.E5w@srngenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
: >

: >(By eliminating the crystal filter, phasing-type SSB transmitters have
: >better phase and amplitude flatness than filter-type rigs.)

: Phfffft! The phase flatness through the audio phase shift networks
: used in amateur phasing SSB rigs was much worse than any phase
: distortion in a filter rig. The audio phasing network had to cover
: octaves while the crystal filter only has to work over a tiny fraction
: of an octave.

Not true. A phasing-type SSB generator specifically depends on a
90 degree phase difference between the two channels. If the phase
flatness were bad, you would get terrible unwanted sideband suppression.

Same thing with amplitude flatness. The phase shift network's two
channels must be matched to within a fraction of a dB to get good sideband
suppression.

A typical SSB crystal filter has a couple dB peak-to-peak ripple across the passband with similar ripples in the group delay. It is easy to do much better than that with a phasing-type exciter.

AL N1AL

Date: 24 Mar 94 23:18:31 GMT
From: envoy.wl.com!caen!math.ohio-state.edu!cyber2.cyberstore.ca!nntp.cs.ubc.ca!
magellan!mprgate.mpr.ca!kapadia@decwrl.dec.com
Subject: SCMO receiver.
To: info-hams@ucsd.edu

I am trying to tune my FM radio to receive a subcarrier frequency. The carrier frequency is 93.7 MHz and the Subcarrier frequency is 92 KHz. I tried adjusting the potentiometer on my radio but to no avail.
I am new to this area could some kind soul help me with this problem.

Thanks a in advance

..ashfaq

Date: Fri, 25 Mar 1994 13:58:51 GMT
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!cs.utexas.edu!
swrinde!sgiblab!wetware!spunky.RedBrick.COM!psinnntp!psinnntp!arrl.org!
zlau@network.ucsd.edu
To: info-hams@ucsd.edu

References <2mn2rd\$ol0@vixen.cso.uiuc.edu>, <1994Mar23.162557.7558@arrl.org>,
<2msav8\$8f9@vixen.cso.uiuc.edu>
Subject : Re: RF and AF speech processors. Was: FT-990 vs TS-850

Ignacy Misztal (ignacy@ux2.cso.uiuc.edu) wrote:

:
: Cheap AF processors use AF clippers. DSP-based processors are not only
: novelties now, but they are more expensive to build than RF processors.
: Why AF clippers are worse than RF (IF) clippers? Consider a 500Hz
: tone test. With AF processor you will get extra 1000,1500,2000,2500
: Hz tones. With RF (SSB and DSB) processor 500Hz will be the only
: output. Please note that some older rigs have "implicit" RF
: processors. For instance, SWAN 500 has 7360, a beam deflection tube,
: as a DSB modulator. By clipping peaks, it acts with the following XTAL
: filter as a DSP processor.

:

If you clip an ideal DSB waveform (1 kHz modulation), aren't there two tones spaced 1 kHz apart that could generate IMD products at 1.5 kHz and 1.5 kHz (receiver output)? What if you had a significant amount of carrier leakthrough that was cleaned up by the crystal filter? Couldn't this give you extra tones at 1, 1.5, 2, and 2.5 kHz (at the receiver)?

--

Zack Lau KH6CP/1 2 way QRP WAS
 8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

Date: Fri, 25 Mar 1994 23:13:06 GMT
From: news.Hawaii.Edu!uhunix3.uhcc.Hawaii.Edu!jherman@ames.arpa
To: info-hams@ucsd.edu

References <1994Mar22.233542.8566@mnemosyne.cs.du.edu>, <bote.764487800@access3>,
<VBREAUULT.94Mar25134216@rinhp750.gmr.com>
Subject : Re: Voice mail on a repeater?

Are there any repeaters left in this country that just repeat, including no musical tones or beeps when you drop your carrier? I miss the old days when all one heard was a nice solid kurchunk of the repeater receiver's squelch tail quickly followed by a second squelch tail from my receiver (the repeater carrier would drop off after 1-2 seconds). This seemed to be the way most of the public safety repeaters were also set up (particularly the California Division of Forestry repeaters back when I was a fireman in the early 70s).

Gary: I'll be disappointed if your repeater beeps.

Jeff NH6IL

Date: (null)
From: (null)
mail info@arrl.org

help
index
quit

...cntl-D and wait

I'm not sure if the hamfest list is as complete as it could be, but it's

pretty good. Have fun!

73, WD0FTF - RUSS (I meant Russ)

Date: Fri, 25 Mar 1994 17:26:52 GMT
From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!
howland.reston.ans.net!pipex!sunic!psinntp!psinntp!arrl.org!zlau@network.ucsd.edu
To: info-hams@ucsd.edu

References <2mlmi7\$3vc@news.ysu.edu>, <1994Mar22.142358.5403@arrl.org>,
<2mul91\$6vo@hawk.eng.warwick.ac.uk>pipex
Subject : Re: Why no 10 meter activity??

Any guesses as to the propagation mode of my 21 MHz contact
nearly 11 years ago

June 26, 1983 3 watts SSB (my end) with W4VNU at 1051Z
(12:51 PM Hawaii standard time) Almost 7 AM in South
Florida. Antenna was a simple wire antenna a few hundred
yards from the beach.

My guess is multiple hop E skip. We are

--
Zack Lau KH6CP/1 2 way QRP WAS
8 States on 10 GHz
Internet: zlau@arrl.org 10 grids on 2304 MHz

End of Info-Hams Digest V94 #329

